XI.

Description of a new Stand for a Reflecting Telescope.

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THE brass tube of the telescope, for which this stand was made, is 42 inches long and 6 inches in diameter. It was mounted originally in Europe on a triangular stand, and was very unsteady, being supported by a small brass pillar with a joint. The tremor made it very difficult to adjust the instrument to distinct vision. It is now mounted on a quadrangular stand, and an axis; and is very steady, having no tremulous motion when the hand is applied to the adjusting wire.

The stand is made wholly of wood, except the parts which give motion to the telescope; these are made of brass. The stand consists of two parts, which may be separated from each other. The upper part, on which the Telescope is fixed, has a mahogany board for a base, 15 inches square and 1 inch and $\frac{1}{4}$ thick; having block-feet under it, to accommodate the axis of a circular board of the same thickness, which revolves on it. The circular board has 6 friction rollers under it and moves very steadily, being held down upon the base by a plate and screw on the lower end of the axis. To this circular board two upright pillars are fixed which support the Telescope on an axis. The axis is made of hard yellow wood; except the ends, which are brass, turning on brass sockets. The axis is 6 inches wide where the Telescope

rests on it; and is made concave, so as to receive nearly the semi-diameter of the Telescope; and makes a steady bed for it. The bed is lined with thin cloth to fit the Telescope more closely to it; this lining also preserves the tube from scratches. It is drawn down tightly into the bed by a brass cross-bar let into the bed and screws, in the same manner in which Telescopes are commonly fixed on stands. The Telescope can therefore be taken off from the stand and kept in a box to prevent the mirrors being tarnished; which is more necessary in this country, where it is difficult to get them perfectly well repolished. The pillars which support the Telescope are 15 inches high, 3 broad, spreading 6 inches at the base to increase their stability. They are so far apart as to allow an axis to be 15 inches, which gives more horizontal steadiness to the Telescope than it would have, if mounted on slender brass supporters, placed near the tube, as they generally are.

A semicircular brass plate is fixed to the under part of the circular board, projecting $\frac{3}{4}$ of an inch from its edge. When the Telescope is brought nearly into the direction wanted for viewing the object, by a horizontal movement of the stand, it is fixed by a clamp on the circular plate; and an accurate adjustment is made by a tangent screw; in the same manner in which the index of the sextant is moved.

The vertical adjustment of the Telescope is by a double mahogany bar 1 inch and $\frac{1}{4}$ square. It is made in two parts, one sliding on the other, through two brass collars, that hold them together; the collars being attached to one part, the other sliding through them. To the sliding part is fixed a slip of brass, having teeth cut upon its edge. On the other part is fixed a pinion and nut to give motion to the sliding piece. One end of the part which has the pinion on it, is connected by a strong brass joint with the

top of a small pedestal, or pillar; the other end is unconnected. This pedestal is placed on a square piece of hard wood, which slides on a brass plate between two parallel grooved rulers across the centre of the circular board; and may be fixed at any part of the diameter when the Telescope is brought nearly to the elevation required. The pedestal is then fixed by a finger screw, seen in Plate V. fig. 2. The opposite end of the sliding part of the double bar is connected by a strong joint with the eye-end of the telescope; and being movable in the collars, an accurate adjustment of the instrument is made by the rack-work.

For so large a telescope, I prefer the double bar to the brass sliding tubes commonly fixed to achromatic telescopes to give them steadiness; and also the method here adopted of sliding across the circular board to give different elevations to the telescope, to that of fixing one end permanently, and shifting the other end to another place, as the sliding tubes are used. My Telescope is so placed on its axis that the centre of gravity is between the axis and the eye-end; so that the tube rests on two supports, the axis and the double bar; for the sliding part of the bar does not move so easily, but that it gives sufficient support to the end with which it is connected. And being permanently fixed to one place, more vertical steadiness is given to the Telescope than could he preserved by shifting it to another place nearer to the axis; as is done with the sliding tubes, to give a greater elevation. When the pedestal is placed at the end of the rulers farthest from the eye-piece; and the double bar is brought to its shortest dimensions, the Telescope has an elevation of 65° above the plane of the circular board. When the pedestal is placed at the end of the rulers, nearest to the eye-piece, and the sliding bar drawn out to its greatest extent, the object-end

of the Telescope is depressed below the horizontal line of the axis; so that it may be used in viewing terrestrial objects.

The other part of the whole stand is a mahogany frame, 40 inches high; 15 inches square at the top, and 24 at the bottom; and cross-braced in every part where necessary, to make it steady. In two of the legs dovetail pieces are let in, which may be drawn out to any length necessary to accommodate the legs to uneven ground, and are fastened by screws.

All the supporting parts being made of hard wood, the unsteadiness arising from the elasticity of brass, which is so much used in mounting telescopes, is removed. And this stand appears to be as steady as a portable instrument, with these movements, can be made. I have never seen one so firm, though some more elegantly mounted; but utility ought not to be sacrificed to elegance. Such a stand as this now described, for large telescopes, costs much less than one in which more brass work is used. The upper part of the stand can be taken from the frame, and used on a firm table, like any other telescope. It is fastened to the frame by two screws, going through the top rail; one of which may be seen in Plate V. *fig.* 1. *Fig.* 1. shows the Telescope on the stand and frame. *Fig.* 2. *A* the square base of the stand; *B* the circular board; *C* the pedestal between the rulers; *D* the tangent screw; *E* the double sliding bar; *F* the bed of the Telescope. *Fig.* 3. *A* shows the hollow bed in front, with the brass plate to which the Telescope is fastened by two screws; *B* the parallel rulers; *C* the tangent screw.

Such is the description of the stand of my Telescope, which I have thought might not be unacceptable to the Academy. It has been seen by several gentlemen who are well acquainted with telescopes, and much approved of by them. I made the brass work myself, and finished it on my birth-day, — 80 years old.

Fig. 1st

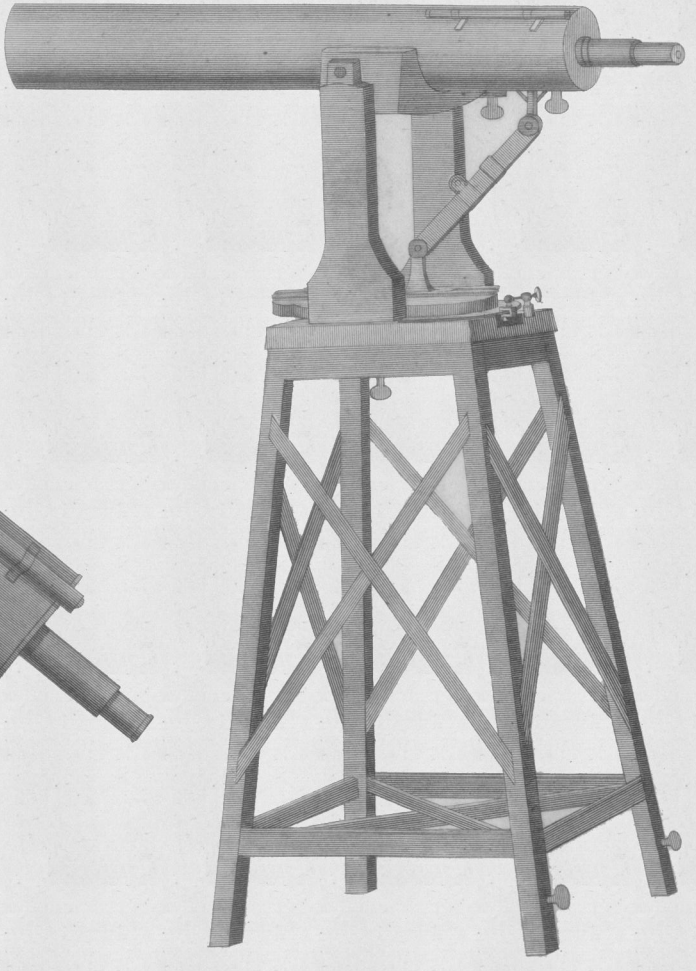

Fig. 2d

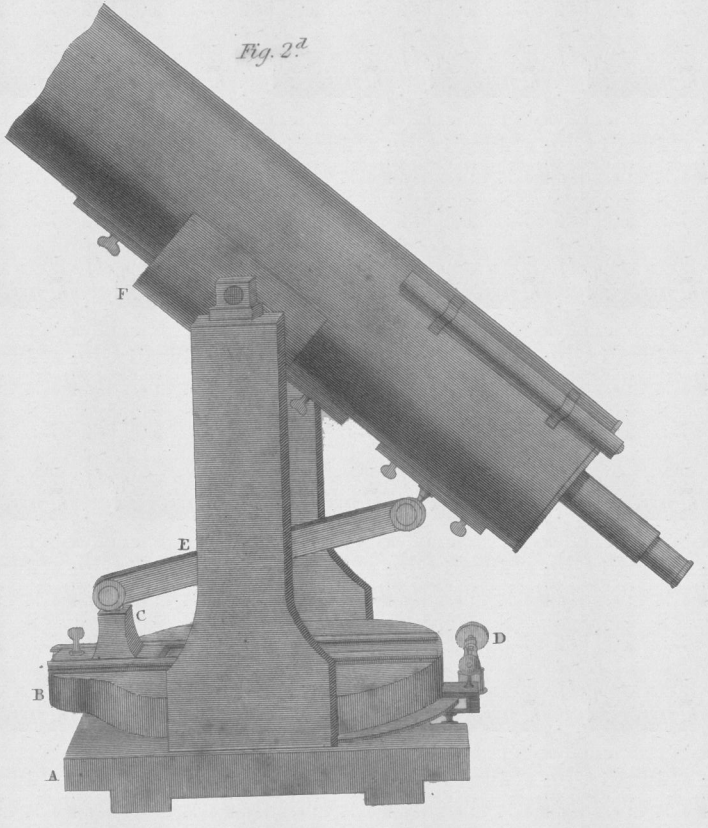

Fig. 3d